

# **Virtualization in Cloud Computing - Characteristics and Benefits**

Nowadays, every service is shifting online. Be it a small or big business, everyone tends to carry their services online.

With the internet and technology, people have realized the importance of online markets. Everything is getting digitized. So many services that needed huge infrastructure can now be done over the internet.

One such example of technology here is Cloud computing. It is no less than a blessing for businesses these days. People used to need huge systems for data storage and management. But now, cloud-based software is here to help. Now, cloud providers use the technique of virtualization. This reduces the cost, energy, and hardware installment for data management.

## **Virtualization in Cloud Computing**

As a short and simple definition, virtualization means creating virtual resources. These resources include a virtual operating system, server, storage device. All these resources are created from one resource of its type. These show up as separate resources that the users can use as independent physical resources.

As a matter of course, a traditional model of cloud computing worked with physical resources. A vendor of cloud services would lend its physical resources of servers, software, and storage devices to the businesses.

But giving individual resources to various clients can be expensive. So here the technique of virtualization comes to the rescue. With this, a cloud vendor can use one big server, virtualize it, and offer smaller servers to different clients.

It includes the use of special software for developing a virtual version of a computing resource. This prevents the creation of an actual version of the same resource.

This means a single computer with the help of this technique can run distinctive operating systems and applications at one time. Thus, virtualization enables the utmost use of hardware.

## **Characteristics of Virtualization**

It is a technique of developing a virtual version of computer hardware, storage devices, and other resources. It has the following characteristics:

### **Platform Virtualization**

The foremost characteristic is that it virtualizes the entire platform. This means it separates an operating system from the prime platform resources. It can virtualize the platform without the setup or investment of separate hardware.

### **Resource Virtualization**

Apart from virtualizing the complete operating system, it also allows resources to virtualize. It enables the virtualization of specific resources of a system. These include network resources, storage, namespaces, and more.

### **Application Virtualization**

Another characteristic is that it also virtualizes applications. It means hosting an application on different software or hardware. For example- portable applications, cross-platform virtualization, etc.

Application virtualization software allows users to access and use an application from a separate computer than the one on which the application is installed. Using application virtualization software, IT admins can set up remote applications on a server and deliver the apps to an end user's computer. For the user, the experience of the virtualized app is the same as using the installed app on a physical machine



### **Execution Management**

The inclusion of virtualization in the environment makes the process of execution more managed and secured. It also enables the application of more features. These include isolation, sharing, and more.

### **Transparent Process**

One of the most important characteristics is the presence of transparency. Since the entire process gets shifted online, it becomes more transparent and secure. All the operations take place on virtual machines which represents a clear and controlled environment.

### **Infrastructure Monitoring**

Virtualization in cloud computing ensures continuous monitoring. It means that one can keep a track of all the operations 24/7 with ease.

## **Benefits of Virtualization**

This technique enables the creation of a virtualized execution environment. It makes the environment more manageable, controlled, and secure. The following points show its benefits:

### **Portability**

One of the greatest benefits of it is portability. The presence of virtual machines helps to port data, servers from one place to another. This ensures easy transportation of files concerning physical systems.

### **Protection of Data**

Data is a critical element for any business. Due to certain malicious activities, the systems get compromised. This can lead to damage or loss of data. Virtualization prevents the data from any loss or damage and thus, provides protection.

### **Security from Attacks**

Another benefit is that it helps in the prevention of attacks. In case an application gets exposed, it can isolate that application from others. In this way, it provides security to the entire operating system.

### **Supports Flexibility**

Organizations sometimes have to share their systems with others. So, it provides the flexibility to share only the desired system without having to disclose the important data or information present over that system.

### **Increased and Better Access**

It offers increased and better access to the organizations over systems and networks. All the resources can be accessed through a single big server. This makes the operating system more efficient.

### **Disaster Recovery**

Every system faces certain malicious disasters every now and then. Virtualization helps the systems to recover from any disasters with ease. Thus, apart from prevention, it is also a great technique for disaster recovery.

### **Cost-Effective**

One of the greatest advantages is that it is cost-effective. It creates a virtual version of the hardware, network resource, and storage devices. This means that there is no need to make any big investments in physical hardware or other equipment.

### **Disadvantages of Virtualization**

Every coin comes with two sides. Likewise, Virtualization also comes with certain disadvantages. Some of them are:

- It is a cost-effective technique when an organization thinks of its implementation. But for a provider, it can cost quite high. After some time, there arises the need for quality hardware and software. So, for this, the provider has to make investments.



- It does provide a great opportunity for growth to businesses. But many organizations use similar resources. This can sometimes slow down the growing process within the same virtual network.
- It needs various links in a chain. These links must work in sync to ensure the functioning of operating systems.
- It needs less time for implementation. But in the long run, it needs great time and patience to ensure smooth continuity of the process.
- To install this, an organization needs skilled staff or has to provide training to them. So, finding and training procedures can be time-consuming and quite expensive.

## **Conclusion**

Virtualization is a great technique for any organization that wants to build its cloud security. Indeed, its implementation is easy but it is not a cakewalk either. The organizations need to strategize, understand and be prepared before the implementation.

It is becoming more of a need than a choice for any business that aims to establish cloud security. Thus, creating virtual resources is the new go-to choice for businesses.